

VI-3. WATERFOWL DISTRIBUTION AND MOVEMENTS IN EAGLE RIVER FLATS

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INTRODUCTION

Waterfowl populations, especially mallards, are decreasing continent-wide (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1989). ERF is an important spring (April to May) and fall (August to October) waterfowl staging area. WP could represent a hazard to migrating waterfowl feeding in ERF (CRREL 1991). Movement data on susceptible waterfowl are needed to determine the potential risk and effects of short- and long-term remediation actions.

The proposed study focused on the dynamics of the waterfowl species most susceptible to white phosphorus poisoning at Eagle River Flats, Fort Richardson, Alaska, such as mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*) and green-winged teal (*Anas crecca*). During the fall (August to October) waterfowl were monitored to determine daily movements, turnover rates and site-specific exposure.

METHODS

During the fall, ducks were captured on Eagle River Flats using either swim-in traps or mist nets. Ducks were individually banded with U.S. Fish and Wildlife Service bands and color marked on the right wing with a 2.5- × 10-cm patagial tag, except for green-winged teal, which were marked with 1.25- × 10-cm tags, made from coated nylon fabric. The colors used were pink for mallards, white for northern pintails, blue for green-winged teal and American widgeon (*Anas americana*) and yellow for northern shovelers (*Anas clypeata*). The capture and release locations and date, band number, weight, age and sex of each duck were recorded. In addition, mallards, northern pintails and green-winged teal were fitted with radio transmitters. Transmitters for mallards and northern

pintails weighed 9.1 g and for green-winged teal, 3.6 g. The transmitter number and frequency of each was recorded.

Ducks were tracked from stations that were equipped with a notebook containing radio tracking forms, a directional yagi antenna, a compass for determining telemetry bearings, and a two-way radio for communications. Ducks were located simultaneously from two fixed and/or one mobile tracking station. The ducks were assumed to be near the point where the bearings cross, and each bearing location was entered onto a radio tracking form. When National Guard helicopters were available, aerial tracking was conducted in helicopters using hand-held antennas and LA12 (AVM Instrument Co., Champaign, IL) or ATS (Advanced Telemetry Systems, Inc., Isanti, MN) receivers to search for radio-instrumented ducks up to 50 km away from Eagle River Flats.

Following capture and release of ducks (8 August through 30 September 1993), daily movements of each duck on ERF were recorded every 30 minutes between 0700 and 1200 and on Monday, Wednesday and Friday from 1900 to 2200. Ducks that could not be detected as moving or did not move more than 10° in 2–3 days were visually located to determine their status. Dead ducks were recovered, or remains were collected for WP analysis. The locations of all dead ducks were recorded.

The daily turnover rate of instrumented ducks on ERF was determined by dividing the number of radio-instrumented ducks that departed ERF each day by the total (by species) instrumented. The daily turnover rate was used to determine the relative WP risk to birds using ERF.

The activity on different areas of ERF was determined by counting the number of observations within an area, dividing by the total number of observations for that bird and expressing it as a percentage. These data from radio-instrumented ducks were used to address concerns about the relative risk of waterfowl by species and to establish baseline data with respect to proposed remediation actions.

RESULTS AND DISCUSSION

From 8 August to 23 September 1993, 39 ducks (12 mallards, 11 northern pintails, 11 green-winged teal, 2 American widgeons and 3 northern shovelers) were each fitted with a backpack transmitter. Twenty-three other ducks, 18

**Table VI-3-1. Status of ducks on Eagle River Flats
from 8 August to 24 October 1993.**

Species	Radioed	No. of ducks						
		Only tagged	Mortality		Remaining on ERF through 30 Sept	On ERF 24 October	No contact before 30 Sept	Observed off ERF
			On ERF	Off ERF				
Mallard	12		2	1	9	2	1	3
Northern pintail	11		2	1	3	0*	7	2
Green-winged teal	11		3	0	1	0	4	1
American widgeon	2	18	1	0	0	0	1	1
Northern shoveler	3	5	0	1	1	0	2	1
Total	39	23	8	3	14	2	15	8

* One northern pintail found dead.

**Table VI-3-2. Time period radioed ducks were captured and the number surviving
through 30 September on Eagle River Flats, 1993.**

Period captured	Mallard		Northern pintail		Green-winged teal		American widgeon		Northern shoveler		Total	
	Captured	On ERF*	Captured	On ERF*	Captured	On ERF*	Captured	On ERF*	Captured	On ERF*	Captured	On ERF*
8-18 August	3	1	0		7	0	1	0	1	0	12	1
19-31 August	4	3	5	0	4	1	1	0	2	1	16	5
1-15 September	0		1	1	0		0		0		1	1
16-30 September	5	5	5	2	0		0		0		10	7

Ducks that stayed on ERF and survived from the time they were captured through 30 September.

American widgeons and 5 northern shovelers received only patagial tags (Table VI-3-1). The movement of instrumented ducks following release indicated that transmitters did not appear to inhibit movements or activities. Observations indicated that the behavior of instrumented ducks did not differ from that of other ducks in its associated flock. On some occasions, instrumented and tagged ducks were noted leading flights of ducks.

Duck movements and distribution on ERF varied by species (Fig. VI-3-1). Most mallards and green-winged teal were captured during August. We felt that this was not a function of effort, since eight to ten mist nets were in operation throughout the study period, but due to hazing in trapping locations (Table VI-3-2). The data indicate that ducks captured in August used a larger portion of ERF than those captured in September. This can be attributed to the start of the hazing program on 1 September. In addition, mallards preferred Area B during August, whereas northern pintails preferred Areas C and the C/D transition. Green-winged teal seem to use a number of areas within ERF during August except for Areas D and BT. Mallards were the only instrumented birds to use Racine Island (Table VI-3-3).



Figure VI-3-1. Example of radiotelemetry results: movement patterns of a mallard male captured in Area D on September 22, 1993, and tracked until October 21, 1993.

Table VI-3-3. Duck activity on Eagle River Flats during August and September 1993.

Species	Code	Area					BT (%)	RI (%)
		A (%)	B (%)	C (%)	C/D (%)	D (%)		
Mallard	B1-2H	0/69	0/5	0/26	0	0	0	0
Mallard	B2-5L	4/0	42/0	0/2	2/22	0/27	0	0
Mallard	B2-5H	0	82/0	0	0	0	0	18/0
Pintail	B1-2L	0	0/2	0	0/41	0/47	0/10	0
Pintail	B2-5L	0	0	36/17	10/27	2/7	0	0
Pintail	B2-4L	0	0	0	10/20	20/50	0	0
Green-winged teal	B2-6L	0/15	0	58/11	5/4	3/3	1/0	0
Green-winged teal	B2-12H	27/57	0/12	0/6	0	2/1	0	0
Green-winged teal	B3-2H	3/0	0	13/0	37/1	28/16	0	0

Table VI-3-4. Ducks leaving Eagle River Flats from 8 August to 30 September 1993.

	<i>Mallard</i>	<i>Northern pintail</i>	<i>Green-winged teal</i>	<i>American widgeon</i>	<i>Northern shoveler</i>	<i>Total</i>
Ducks (no.)	1	7	4	1	2	15
Avg. days on ERF (no.)	15	12.3	16.5	1	9.5	12.5
Range (no. days)	15	1-32	1-32	1	1-18	1-32

Daily duck movements indicated that mallards and northern pintails moved among areas quite readily. Factors influencing why mallards used Area B almost exclusively during August might have been due to water depth and/or availability of food. During the course of the study, from 8 August to 30 September 1993, 15 of 39 instrumented ducks left ERF (Table VI-3-4). Northern pintails and green-winged teal represent 47% and 27%, respectively. The average stay of those ducks on ERF was about 12 days (range 1-32 days). However, the greatest turnover of ducks occurred in mallards between October 1 to 22, 1993 (Fig. VI-3-2 to VI-3-4), when over 90% of the mallards left ERF.

The mortality of instrumented ducks using ERF between 8 August and 24 October 1993 was eight ducks, or about 20% (Table VI-3-5). The average number of days these ducks resided on ERF was 20 days, with a range of 7-43 days. Overall the length of time on ERF before mortality was slightly longer for mallards (Table VI-3-5).

In conclusion, we feel that the movements of ducks on ERF were influenced by hazing, the presence of researchers or obstructions in certain areas. Since all the data for this study have not been completely analyzed, we can only generalize about the overall use of ERF. The turnover rate on ERF is low, which makes ducks at a greater risk to WP poisoning. However, the combination of the estimated turnover rate, mortality and population number will give a much clearer picture of the number of waterfowl lost during August to October.

Table VI-3-5. Duck mortality on Eagle River Flats from 8 August to 24 October 1993.

	<i>Mallard</i>	<i>Northern pintail</i>	<i>Green-winged teal</i>	<i>American widgeon</i>	<i>Northern shoveler</i>	<i>Total</i>
Mortality (no.)	2	2	3	1	0	8
Avg. days (no.)	28	20	21	3	0	20.3
Range (no. days)	13-43	7-33	11-37	3	0	7-43

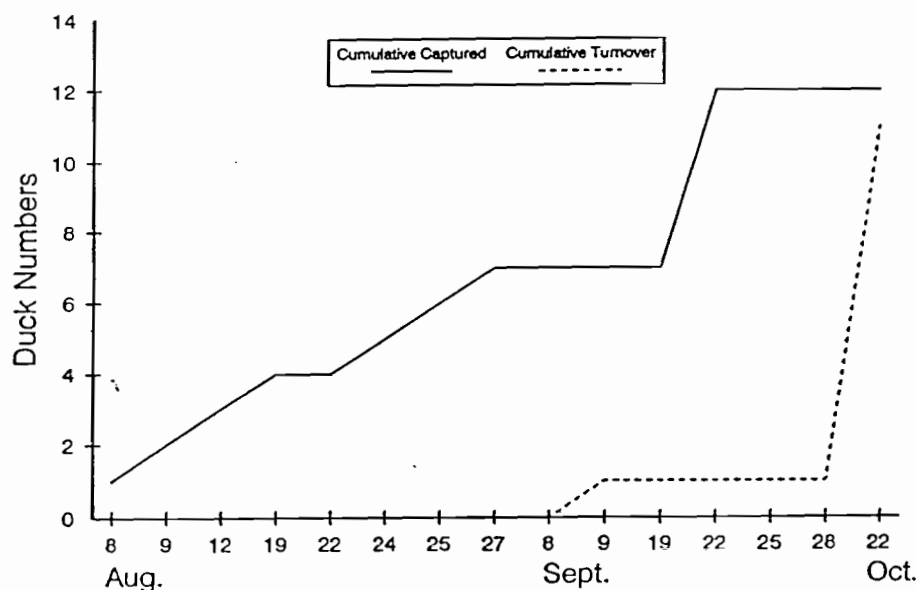


Figure VI-3-2. Turnover rate of mallards using ERF.

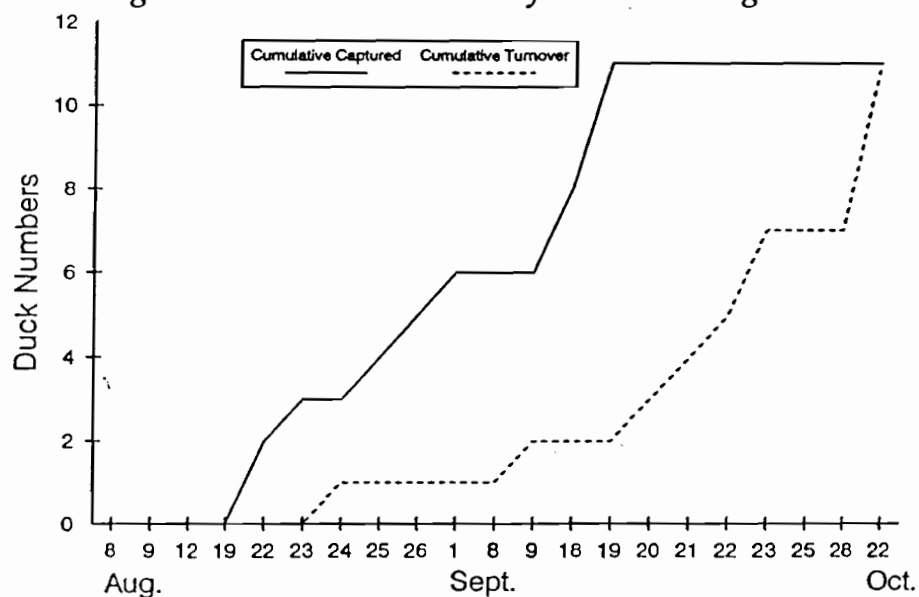


Figure VI-3-3. Turnover rate of northern pintails using ERF.

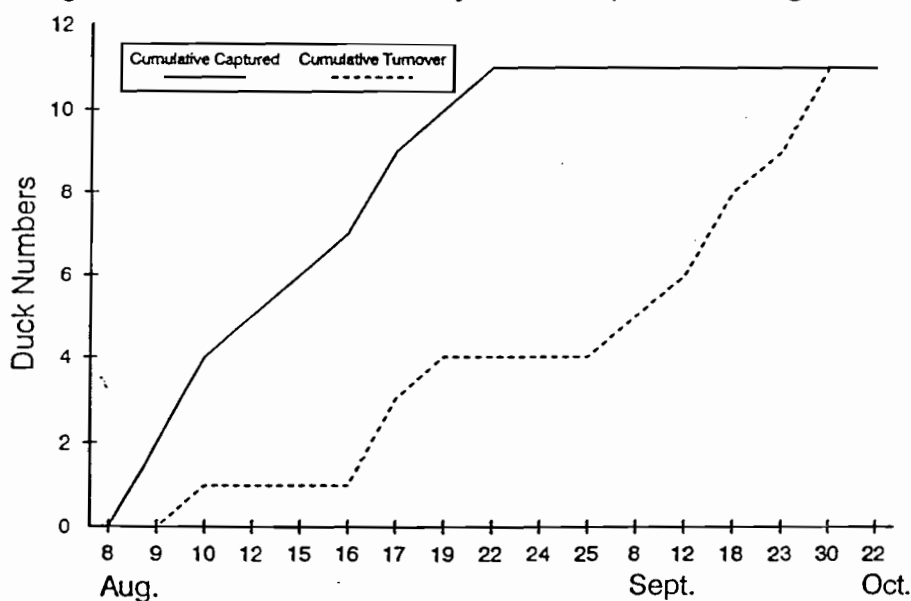


Figure VI-3-4. Turnover rate of green-winged teal using ERF.

LITERATURE CITED

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